

Supply sequencer

It is often the case with electrical systems using more than one power supply that the supplies must be switched on in a defined sequence to avoid electrical damage that may otherwise occur. The MAX6820 chip from Maxim (<http://pdfserv.maxim-ic.com/arpdf/MAX6819-MAX6820.pdf>) contains all the necessary control circuitry to perform this function in one package. The chip samples the primary supply V_{CC1} at its input SETV (pin 3) via the potential divider formed by R1 and R2. When the voltage at this pin rises above 0.62 V a timer is initiated in the chip. At the end of this timer period the GATE output switches an N-channel MOSFET to connect V_{CC2} through to the secondary circuitry. Both V_{CC1} and V_{CC2} must be greater than 2.125 V otherwise the chip will detect an under-voltage condition and turn off the MOSFET. The values of R1 and R2 can be calculated using the equation:

$$R1 = R2 [(V_{TH} / V_{TBIP}) - 1]$$

Where

V_{TH} = triggering threshold voltage

$$V_{\text{TRIP}} = 0.62 \text{ V}$$

Capacitor C_{DELAY} gives the time delay t_{DELAY} and is calculated using the equation:

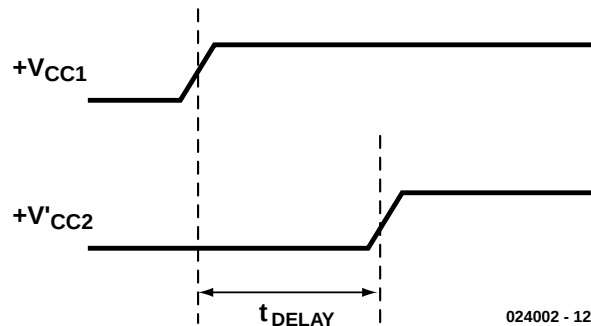
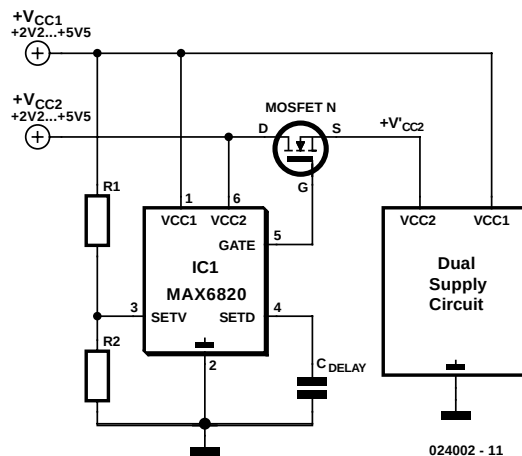
$$t_{\text{DELAY}} = 2.484 \times 10^6 \times C_{\text{DELAY}}$$

Where

The units for C_{DFIAY} are μF .

t_{DELAY} is in seconds.

The MAX6820 uses an integrated charge pump to drive the MOSFET gate ensuring that the N channel MOSFET is fully enhanced with a low $R_{DS\ ON}$. To select a MOSFET choose one with a suitable $R_{DS\ ON}$ for a V_{GS} bias of 5 V to 6 V. A BSP17, for



example, may fit the bill and comes in a SOT223 package. The MAX6819 performs the same function but has a fixed time delay of 200 ms. This device has no need for an external timing capacitor so the C_{DELAY} input is replaced by an ENABLE input.